J. G. MURDOCK.

Hydrant.

No. 164,864. Patented June 22, 1875.

FIG. 1.

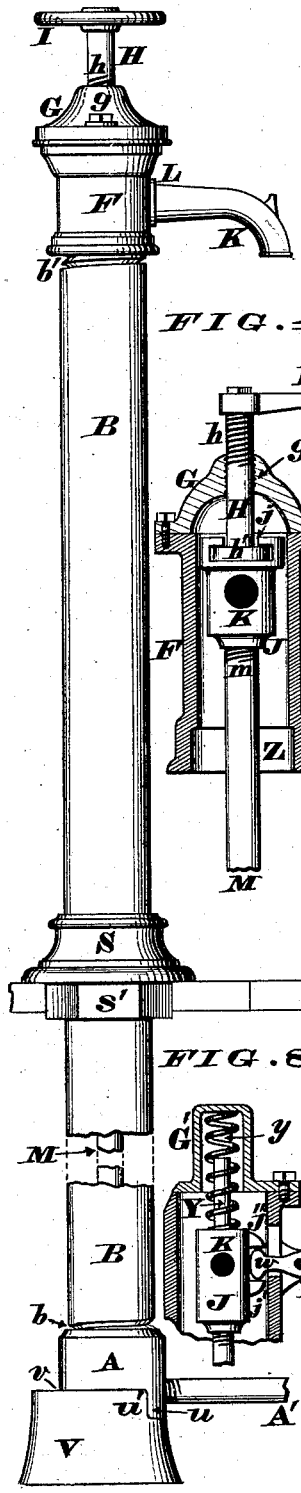


FIG. 2.

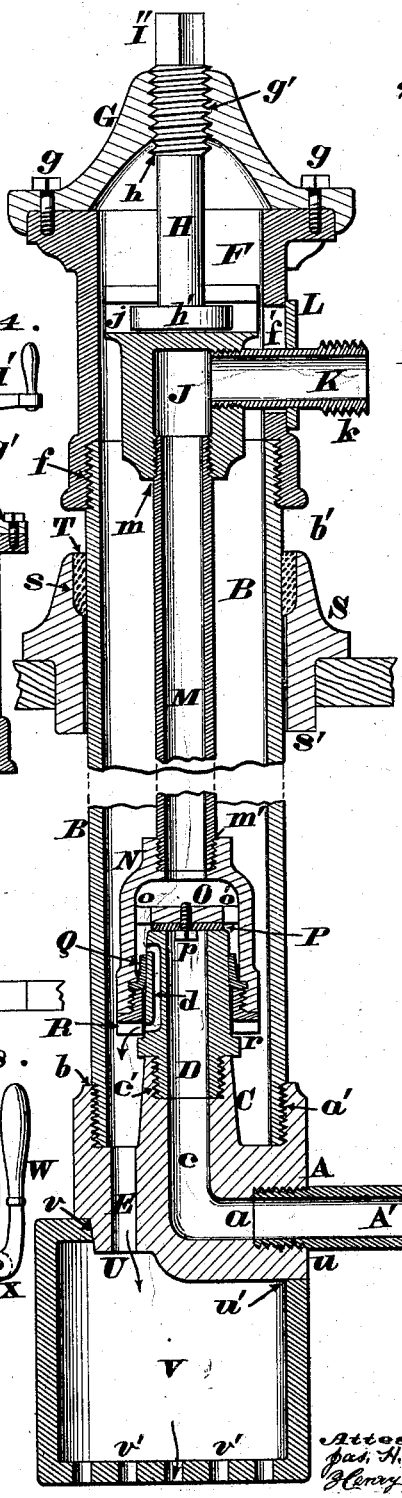


FIG. 3.

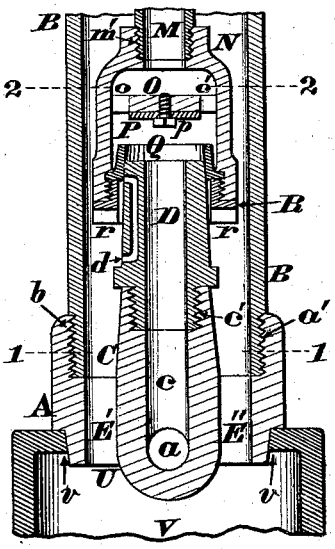


FIG. 4.

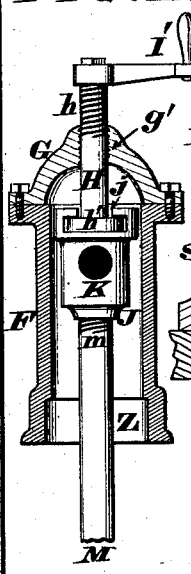


FIG. 5.

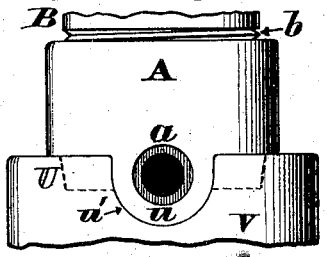


FIG. 6.

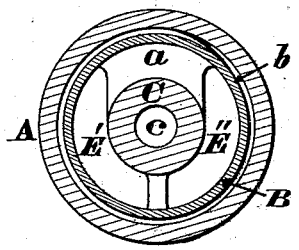


FIG. 8.

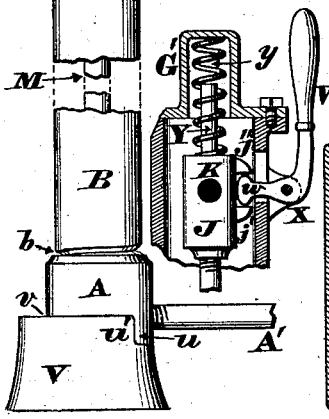
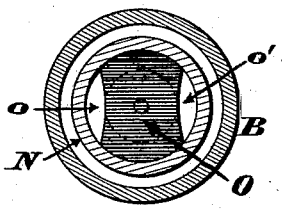


FIG. 7.



John G. Murdock
by Knight Bros.
Att'ys.

Attest:
Pat. H. Layman,
Henry Tanner

UNITED STATES PATENT OFFICE.

JOHN G. MURDOCK, OF CINCINNATI, OHIO.

IMPROVEMENT IN HYDRANTS.

Specification forming part of Letters Patent No. **164,864**, dated June 22, 1875; application filed April 28, 1875.

To all whom it may concern:

Be it known that I, JOHN G. MURDOCK, of Cincinnati, Hamilton county, Ohio, have invented certain new and useful Improvements in Hydrants, of which the following is a specification:

This invention comprises a new manufacture of those hydrants whose stocks or external cases are composed of iron, whereby strength, durability, cheapness of construction, and neatness of appearance are combined in an eminent degree.

In its simplest form my stock consists essentially of but three members—to wit, a cast-iron base, which is concealed in the ground when the hydrant is set up, a cast-iron head or top, which is elevated a suitable distance above the ground, and a wrought-iron pipe or tube of sufficient length to unite said base and head, this union being effected by simply screwing said cast members to the respective ends of such pipe. Of these two castings, the lower one has the inlet-pipe and valve-seat applied to it, while the upper cast member has the discharge nozzle or spout projecting from or through it; and said upper casting also contains the screw, eccentric, or other actuating devices, which operate my moving water-way, that communicates with or terminates in the aforesaid spout. This moving water-way is tubular, and occupies an axial position within the wrought-iron pipe, which constitutes the entire middle portion of the stock. The moving water-way has, at its lower end, a suitable valve, which operates to close the hydrant whenever said water-way reaches its lowest position.

My invention further comprises a peculiar construction of valve-seat proper, of non-corrosive metal, which seat is united to the cast-iron base by being screwed into the same, as hereinafter more fully described.

My invention further comprises the provision of a peculiarly-formed annulus or curb, which surrounds the wrought-iron member of the stock at the point where said stock emerges from the ground or pavement. This curb serves the twofold purpose of imparting a finish to the hydrant, and also of maintaining the stock in its proper position.

My invention, in its preferred form, further comprises an arrangement of spiral spring, which coacts with the weight of the moving water-way to automatically close the same in opposition to the outward stress of the water, the same being combined with a conveniently-adapted bell-crank handle or lever for elevating said water-way when it is desired to open the hydrant.

In the accompanying drawing, Figure 1 is an elevation of my improved hydrant in its closed condition, a portion of the stock beneath the pavement being broken away. Fig. 2 is an enlarged axial section through the operative parts of the apparatus, the hydrant being shown as arranged for use as a fire-plug or street-washer. Fig. 3 is a vertical section through the base or lowermost member of the hydrant, the valve being shown elevated, so as to allow water to flow through the apparatus. Fig. 4 is a vertical section, showing a modified form of the upper member of the hydrant, the moving water-way being represented as elevated. Fig. 5 is an elevation, showing a portion of the base and its inlet. Fig. 6 is a horizontal section through the casting which forms the base-chamber, and through a portion of its attached wrought-iron pipe at the line 1 1. Fig. 7 is a horizontal section through the valve and the wrought-iron stock at the line 2 2. Fig. 8 shows a modification of the devices for operating the moving water-way.

A represents a casting, constituting the base or bottom member of my hydrant stock or case. Said base is tapped on one side, at *a*, to receive the inlet-pipe A′, which latter may communicate with the street-main or other source of water-supply. The upper portion of said base is chambered out a sufficient distance, and is provided with a female screw, *a′*, with which is engaged the male screw *b* of a wrought-iron tube or pipe, B, which latter is long enough to project a sufficient distance above the ground when the hydrant is set. Occupying an axial position within this chambered portion of the base is a vertically-projecting nozzle, C, having a channel, *c*, which communicates with the inlet *a*. This nozzle is screw-threaded at *c′*, for the engagement of a short tube, D, having a side passage, *d*, that constitutes the wasteway of the hydrant.

Furthermore, the base A is provided with apertures E, or with two or more slots, E′ E″, for a purpose which will presently appear.

The wrought-iron pipe or stock B of the hydrant is screw-threaded, *b′*, at its upper end, so as to engage with the female screw *f* of the cast-iron head F, to which latter the cap G is secured by means of bolts or screws *g*. This cap may have a female screw or nut, *g′*, to receive the screw-threaded portion *h* of a stem H, whose lower end carries a disk or button, *h′*, while the upper end of said stem is provided with a hand-wheel, I, as shown in Fig. 1, or with a winch or crank, as represented at I′, Fig. 4; or, if preferred, the stem may have a non-circular termination, I″, for the reception of a spanner or wrench, or key, as shown in Fig. 2.

The button or collar *h′* engages with the slot *j* of a hollow yoke, J, from which projects laterally the discharge pipe or spout K, which may curve downwardly, as seen in Fig. 1, or be perfectly straight, as represented in Fig. 2. The curved shape of spout is preferred when the apparatus is to be used as an ordinary hydrant; but when it is to be employed as a street-washer or fire-plug the straight and screw-threaded spout K *k* becomes preferable.

In order to permit the proper vertical movement of the spout K, the cast-iron head F has a longitudinal slot, *f′*, preferably concealed by a scutcheon or guard-plate, L, that rides upon the spout K.

The upper end of the moving water-way M is screw-threaded at *m*, to engage with the hollow yoke J, while the lower end of said water-way is screw-threaded at *m′*, for attachment of the shell N of the valve apparatus. This shell has a bridge, O, cast within it, which bridge is flanked by two ports, *o o′*, through which water flows into the pipe M as soon as the hydrant is opened. Secured to the under side of this bridge, by means of a screw, *p*, or otherwise, is a leather or other suitable disk, P, which constitutes the valve proper of the hydrant. During the lowest or normal position of the pipe M the disk P closes the top of tube D, and thus shuts the hydrant. In order to prevent any escape of water between the tube D and the shell N, a cupped leather packing, Q, is secured to said shell by a nut, R, having, on opposite sides, notches or sockets *r* for the reception of a wrench or spanner. This cupped leather fits snugly around the accurately-turned exterior of tube D.

A loose collar, fillet, or curb, S, is slipped over the tube B previously to the screwing on of the head F, and after the hydrant has been set up, and the flooring or pavement laid, said fillet is permitted to rest thereupon. The fillet S is chambered, as at *s*, for the reception of a cement or fusible filling, T, so as to hold the hydrant immovably to its erect position, and at the same time to impart a sightly finish to the column, or that part of the hydrant-stock which appears above ground. In order to prevent any rotation of the fillet relatively to the stock, the former may be furnished with a hexagonal or other non-circular flange, *s′*, against which the bricks of the pavement may abut; or said flange may be embedded in a suitable wooden sill.

Projecting from the bottom of the base A is an annular flange or rim, U, which enters a circular orifice, *v*, in the top of sediment-chamber V, that is perforated at *v′*, and occupies an eccentric position relatively to said base, which latter has a tongue or tenon, *u*, that, occupying a suitable recess in said chamber, prevents any rotation of the stock. The object of this sediment-chamber is to collect the waste-water that escapes from the pipe M when the hydrant is shut off, and allow such waste to be gradually absorbed by the ground, while guarding the hydrant from the entrance into it of sand or dirt.

The most complete, and, for some situations, preferable form of my opening and closing devices is shown in Fig. 8, in which the operating valve-stem H is dispensed with, and the hollow yoke J is elevated by a bell-crank lever, W, which is pivoted to the cast head of the hydrant at X. The inner end of this lever is furnished with a cam, *w*, that engages between two spurs or lugs, *j′ j″*, which project laterally from the yoke J. Rising vertically from this yoke is a stem, Y, around which is coiled a spring, *y*, whose stress, acting directly downward, co-operates with the weight of the charged pipe M, to depress the latter, and thus close the hydrant, on the release of the lever W. The stress of the spring is so regulated as to just overcome the upward pressure of the flowing water with sufficient force to promptly and effectually close the valve, but without such sudden action as to cause any water-ram. The coiled spring is wholly inclosed within the chambered cap G of the hydrant-head. In the modification shown in Fig. 4, the lower end of the cast-iron hydrant-head is represented as having a smooth or unthreaded socket, Z, into which the upper end of the middle member B may be secured by means of cement, fusible metal, or other bond.

The operation of my hydrant in its preferred form is as follows: When the hydrant is closed all water remaining in the delivery-pipe or water-way M escapes, through the wasteway *d* and channel E, into the sediment-chamber or shoe V, and escapes through the latter's perforations into the ground, as indicated by arrows in Fig. 2. On elevation of the pipe M, by means of the lever W or otherwise, the water rushes up through the tube D, ports *o o*, and the said pipe M, and discharges through the spout K. When the valve-pipe M is thus elevated the capped packing Q covers the entrance of the wasteway *d*, and thereby prevents the escape of water therethrough. On release of the lever, the stress

of the spring and the weight of the moving parts coact to automatically close the hydrant; but being done against the pressure created by the outflow, it is impossible that the closure can take place in so abrupt a manner as to endanger the containing-pipes.

My present improvement is similar to that described in my patent of May 26, 1863, reissued May 11, 1869, in that it closes against the pressure, but in its preferred form differs from it and from all others heretofore known to me in that such closure is automatic. Over the common cast stocks the composite stock of cast and wrought iron possesses the manifest advantages of easy repair of any one part, greater endurance, cheapness, lightness, and sightly appearance.

I am aware that composite hydrant-stocks have been attempted or proposed, but hitherto without success, proving to be very expensive on account of its being necessary to cut and slot the wrought pipe to allow of the connection of the inlet and discharge tubes. It will be seen that my wrought-iron stock B is entirely free from cut or slot of any kind, and that the only labor necessary to expend upon this part of the hydrant is to form the screw-threads *b* and *b'*, upon the ends, and the corresponding threaded sockets in the base and head. The valve-seat D *d*, being a separate piece from the base A, can be composed of non-corrosive metal, and be turned and fitted very expeditiously; after which said seat can be so securely screwed into the nozzle C as to render the members A and C practically a single piece, as far as the necessary strength, immobility, and freedom from leakage are concerned. A great saving is effected by making the seat alone of brass or other non-corrosive metal, it being evident that if said seat and its supporting and containing base were made wholly of such a metal the expense of the hydrant would be materially greater without the least corresponding benefit.

That portion of my stock B which is concealed in the ground may be composed of several sections of gas-pipe, by which means short pieces can readily be utilized, which would otherwise be thrown into the scrap pile. The water-way M, with its attached shell N, may be withdrawn at any time, either for inspection or repair of the valve P, or for renewal of the capped packing Q.

Another advantage peculiar to my improvement consists in the facility with which hydrants of various lengths can be manufactured without any expensive alterations of patterns, because the base A, with its attached valve-seat, and the head F, with its inclosed operating devices, can be readily shipped in their complete condition to any part where a wrought stock can be applied, of any length to suit the specific location.

Plumbers can obtain very cheaply, and already screw-threaded, any number of remnants of pipes of every length, in gas and water pipe establishments, and from pipe-makers, and consequently a pair of pipe-tongs are all the tools required to fit up such a hydrant.

The portion B of the stock can be lengthened, so as to conduct water to the most elevated part of the house, or, in fact, as high as the pressure will force the water, the head F being applied to the top of the stock in the same manner as though the hydrant were located upon the pavement.

The bridge O being cast in one piece with the shell N obviates the necessity of fitting these two members together, and reduces the original cost of the hydrant accordingly.

I claim as new and of my invention—

1. The slidable and chambered collar or curb S *s*, surrounding the stock B, and adapted to contain a filling, T, as and for the purpose stated.

2. The combination of bent lever or handle W, pivoted to the head at X, and having a cam, *w*, which engages with lugs *j' j''* of the yoke J, said yoke being depressed, so as to shut off the water, by a spring, *y*, coiled around a stem, Y, in the manner set forth.

3. In combination with the perforated or slotted base A E or A E' E'', the perforated sediment-chamber V *v v'*, as and for the object stated.

4. The valve-bridge O and ports *o o'*, cast with the shell N, as and for the purpose set forth.

In testimony of which invention I hereunto set my hand.

JOHN G. MURDOCK.

Attest:
GEO. H. KNIGHT,
JAMES H. LAYMAN.